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Comparison of Curriculum Development Practices

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Abstract

Lesson and unit plans designed by preservice teachers who developed their plans using the backward design model or a traditional model of curriculum design were compared. Two independent raters scored 153 lesson and unit plans developed by preservice teachers in two different sections of Educational Planning and Management. The plans were evaluated using Danielson's Framework for Professional Practice by means of six components: demonstrating knowledge of content and pedagogy, demonstrating knowledge of students, selecting suitable instructional goals, demonstrating knowledge of resources, designing coherent instruction, and assessing student learning. Results included evidence that preservice teachers who were taught curriculum design using the backward design model outperformed preservice teachers who were taught curriculum design using a traditional model on all six components.

On Saturday, March 2, 2002, President Bush pledged to work to enlist a new generation of well-trained teachers to help America's children succeed in school. Highlighting his educational agenda, Bush said in his weekly radio address: "The effectiveness of all education reform eventually comes down to a good teacher in a classroom. A good teacher can literally make a lifelong difference" (Associated Press, 2002, p. A3). In 2002 Bush approved nearly three billion dollars from the education budget to be used for teacher training, recruiting, and hiring. If federal funds are going to be spent on educational reform and teacher training, it would be imperative to know on what training contents money should be spent.

The improvement of our nation's educational system is under greater scrutiny than ever before because of Bush's educational agenda.

When designing curriculum, a vital component of teacher training, it is important to determine which curricular design process is effective to allow for the teacher to demonstrate knowledge of content and pedagogy, demonstrate knowledge of students, select suitable instructional goals, demonstrate knowledge of resources, design coherent instruction, and assess student learning, components of planning and preparation tasks required of beginning teachers (Danielson, 1996). These six components include those aspects of teaching that are expected of experienced as well as beginning teachers. Therefore, it is critical that when planning and preparing curriculum, future educators employ the curriculum process that best incorporates these six components of effective teaching.

The field of curriculum development is not static; new procedures are being suggested for changing existing curricula all the time, even though it may be a new name for an old or existing idea. However, if individuals look back over the history of curriculum development, they will learn that the backward design process is somewhat unique, not found in historical literature.

Curriculum development has been in existence since the mid-1800s when William Harvey Wells divided all students in the city of Chicago into grades and established a distinct course of study for each subject at each grade level (Tyack, 1974). In 1892, the National Education Association's Committee of Ten was charged with developing a plan for standardizing the high school curriculum. The plan was to prepare secondary school adolescents for the entrance requirements of college by using subject differentiation at public schools (Kliebard, 1995). This central, discipline-oriented, college preparation curriculum survives to this day, as does the idea that curriculum planning is, for the most part, subject naming, specifying content, and ordering the treatment (Walker & Soltis, 1986).

These pragmatic intentions were given philosophical validation by educational theorists who believed "the task of the school was to deliver a prescribed body of subject matter, based on idealist and/or realist views of knowledge" (Dittmar, 1993, p. 6). Adding to the philosophical justification for curriculum according to individual subject areas were those educational philosophers who favored technical approaches to curriculum development. The technical-scientific approach is a way of thinking, a planning of curricula to optimize students' learning. The dominance of the organization of curriculum using the technical-scientific approach was and still is apparent among public schools in the United States (Dittmar, 1993; Orstein & Hunkins, 1998). Since the 1920s,

curriculum development was driven by the technical-scientific approach. Influential models developed by Tyler (1950) and Taba (1962) directed curriculum developers and teachers in their planning process for years. The designers of these traditional models listed similar steps in curriculum construction: (1) define the goals, purposes, or objectives, (2) define experiences or activities related to the goals, (3) organize the experiences and activities, and (4) evaluate the goals.

In 1998, Wiggins and McTighe presented a similar model but changed the order of the steps familiar to the previously mentioned curriculum developers. Wiggins and McTighe include these steps: (1) identify the desired results, (2) determine the acceptable evidence, and (3) plan learning experiences and instruction. They expect that by using their approach in designing curriculum, educators would use more standard-based teaching as opposed to activity-based instruction. The latter is mostly hands-on without being minds-on. Wiggins and McTighe also expect educators would use more standards-based teaching as opposed to coverage-oriented instruction, where the teacher merely checks off topics that were covered and moves on (Wiggins & McTighe, 1998). Typically, many teachers begin with textbooks, time-honored activities, and favored lessons rather than obtaining essential content from standards or targeted goals. The authors promote the reverse: "One starts with the end – the desired results (goals or standards) – and then derives the curriculum from the evidence of learning (performances) called for by the standard and teaching needed to equip students to perform" (Wiggins & McTighe, 1998, p. 8). The backward design the authors are advocating is "logically forward and commonsensical but backward in terms of conventional habits, whereby teachers typically think in terms of a series of activities or how best to cover a topic" (Wiggins & McTighe, 1998, p. 8). This backward approach to design also departs from another common procedure, thinking about assessment as something to do at the end of a lesson. Backward design promotes choosing goals and standards in terms of assessment evidence as one begins to plan a course or unit (Wiggins & McTighe, 1998).

Wiggins and McTighe (1998) describe their "backward" design as being the most effective of curricular design strategies. I was intrigued with the philosophical underpinnings of this approach and its possible value, especially when utilized with preservice teachers; therefore, I wanted to compare lesson and unit plans designed using the backward design model to those developed using a traditional curricular design process. To date, no study has systematically compared the backward

design to other models for its utilization in teacher education programs. The present study was designed to meet this objective. Specifically, I investigated the reflection of preservice teacher's (1) knowledge of content and pedagogy, (2) knowledge of students, (3) selection of instructional goals, (4) knowledge of resources, (5) design of coherent instruction, and (6) assessment of student learning in their lesson and unit plans. These are six components that Danielson (1996) identified as being critical when defining and describing excellence in teaching during the planning and preparation process.

Method

Subjects

Two evaluators analyzed a total of 153 lesson and unit plans developed by preservice teachers in two different sections of a teacher education coursework, namely, Educational Planning and Management. I chose this course because of its emphasis on curriculum development. The participants were from intact groups listed as juniors or seniors on the course registration list. All 59 participants were in the elementary teacher education program; therefore, most had taken comparable courses of study prior to taking Educational Planning and Management. In the control group, 94% of the students were female and 6% were male. In the experimental group, 82% were female and 18 % were male. In the control group, 13% of the students were nontraditional, 25 years of age or older, and in the experimental group, 28 % were nontraditional. Prior to taking the planning course, students in both groups mentioned having to prepare lesson plans in several classes; therefore, both groups had some lesson and unit planning background knowledge.

For this study, I taught curriculum development using two different designs. The experimental group received instruction taken from Wiggins' and McTighe's book and workshop *Understanding by Design*, and the control group received instruction that included the traditional steps as stated earlier, prior to my research and attendance at an *Understanding by Design* workshop. The post-analysis was a framework designed to analyze the lesson and unit plans developed in the two treatment groups; it included six components of the planning and preparation domain of Danielson's (1996) framework for teaching.

Instrument

The instrument utilized is considered a professional practice framework that contains four domains. For the purpose of this research, domain one, planning and preparation, was utilized. Domain one contains six components, and each component was scored using levels of performance or a rating scale. This form of rating scale provided descriptions of performance and the reviewers checked the most appropriate description. I chose two experts in the field of lesson planning and curriculum development to individually conduct a blind review of each lesson (114) and unit plan (39) using the framework of the planning and preparation domain.

The framework used measured the six components with a rating scale for each criteria of each individual component. For example, the first component, demonstrating knowledge of content and pedagogy, was based on three criteria: knowledge of content, knowledge of prerequisite relationships, and knowledge of content-related pedagogy. Bidner (2001) alluded to this component when he stated instruction is “based on the premise that an effective teacher must be able to integrate content knowledge with pedagogical understanding to assure that all students learn and perform at high levels” (p. 3).

The next component, demonstrating knowledge of students, was divided into four elements or criteria: knowledge of characteristics (social, intellectual, and emotional) of age group; knowledge of students’ varied approaches to learning; knowledge of students’ skills and knowledge; and, knowledge of students’ interests and cultural heritage. The American Federation of Teachers (1990) claimed teachers should, “understand students’ cultural backgrounds, interests, skills, and abilities as they apply across a range of learning domains and/or subject areas” (p. 30). Selecting instructional goals was the third component. In a study by Walker (1985), he emphasized the important link between effective teaching and learning and the teacher’s development of learning goals that are appropriate for a diverse group of learners. This component was also divided into four elements: value that reflects important learning; clarity of student learning; suitability for diverse students; and, balance of learning opportunities.

For the fourth component, demonstrating knowledge of resources, there were two criteria: resources for teaching and resources for students. Evertson and Brophy (1980) discussed the importance of using a variety of materials and resources to improve student achievement. Designing coherent instruction, the fifth component, included four criteria: learning activities, instructional materials and resources, lesson and unit structure, and instructional groups. Armento (1977) agreed that coherence

is important when he stated that students learn better when instruction is logically sequenced. When assessing student learning, Reynolds (1992) and Walker (1999) believed that effective teachers plan goals and assessments simultaneously. For this final component, assessing student learning, Danielson listed three elements: congruence with instructional goals, criteria and standards, and use for planning.

Procedure

Each evaluator measured each criterion using a rating scale: one (1) signified an “unsatisfactory” rating; two (2) represented “basic” knowledge; three (3) denoted a “proficient” level of understanding in the specific criteria; and, four (4) represented a “distinguished” rating on the scale. Two experts in the field of curriculum development read through and scored each element or criterion utilizing this scale. Danielson (1996) distinguished between the four levels of performance:

- Unsatisfactory: The teacher does not yet appear to understand the concepts underlying the component.
- Basic: The teacher appears to understand the concepts underlying the component and attempts to implement its elements. But implementation is sporadic, intermittent, or otherwise not entirely successful.
- Proficient: The teacher clearly understands the concepts underlying the component and implements it well.
- Distinguished: Teachers at this level are master teachers and make a contribution to the field, both in and outside their school. (pp. 36-37)

Results

The Pearson product-moment correlation coefficients between the two raters for the six components were high, ranging from $r = .84$ to $r = .94$. For the overall research question of this study, I employed a one-way MANOVA. The question was this: Were the population means for the scores from the planning and preparation framework different for the two groups: lesson and unit plans that were designed by elementary preservice teachers having been taught a traditional method of curriculum design and lesson and unit plans that were designed by elementary preservice teachers having been taught the backward design method?

I conducted a one-way multivariate analysis of variance (MANOVA) to determine the effect of the independent variable or types of curriculum designs (the traditional design and the backward design) on

the dependent variables of demonstrating knowledge of content and pedagogy, demonstrating knowledge of students, selecting suitable instructional goals, demonstrating knowledge of resources, designing coherent instruction, and assessing student learning. Differences were found among the two curriculum designs on the dependent measures, Wilks' Lambda (Λ) = .82, $F(6, 146) = 5.53, p < .001$. The multivariate η^2 of .19, based on Wilks' Λ , indicated a relationship between the curriculum design factor and the dependent variables.

Because the MANOVA was significant, I conducted individual ANOVAs on each of the six components or dependent variables. To control for a Type I error across the multiple ANOVAs, I utilized the traditional Bonferroni procedure. Each ANOVA was tested at the .0083 level (.05 divided by the number of ANOVAs conducted, which was six).

As mentioned previously, I conducted a one-way analysis of variance (ANOVA) to evaluate each sub-question: Were the population means for the scores from demonstrating knowledge of content and pedagogy; demonstrating knowledge of students; selecting suitable instructional goals; demonstrating knowledge of resources; designing coherent instruction; and assessing student learning components of the planning and preparation framework the same or different for the two groups? The independent variable, curriculum design, included two groups, the traditional approach and the backward design approach. The dependent variables are listed in the question. Of the six questions, all were statistically significant in the anticipated direction. These were 1 ($p < .001$), 2 ($p < .001$), 3 ($p < .001$), 4 ($p = .002$), 5 ($p = .001$), and 6 ($p = .001$). The means and standard deviations for each of these variables are found in Table 1.

Discussion

Based on Danielson's framework, elementary preservice teachers who learned curriculum design using the backward design method outperformed elementary preservice teachers who learned curriculum design using a traditional method during this study. Backward design students attained a higher level of performance when displaying content knowledge and making connections between the content and other disciplines, and developing plans that reflected current research on best pedagogical practices. Similar results were found in the areas of recognizing students' skills, approaches to learning, interests, and cultural

backgrounds and assessing instructional goals and communicating the criteria for those assessments.

When selecting instructional goals, backward design students demonstrated ability to set more clear and suitable goals for students in the class. When demonstrating knowledge of resources, backward design students demonstrated more awareness of resources available through and outside the school district. For the component designing coherent instruction, backward design elementary preservice teachers attained a higher level of performance when developing plans that linked learning activities, teaching materials and resources, and instructional groupings to the instructional goals.

Table 1
Means and Standard Deviations on the Dependent Variables for the Two Groups

Components of Rating Scale	Curriculum Design .00 = Traditional 1.00 = Back Design	Mean	Standard Deviation	N
Content	.00	2.1171	.6117	74
	1.00	2.5928	.7332	79
	Total	2.3627	.7159	153
Students	.00	2.0304	.4658	74
	1.00	2.4003	.4949	79
	Total	2.2214	.5141	153
Goals	.00	2.0777	.6319	74
	1.00	2.6535	.8344	79
	Total	2.3750	.7952	153
Resources	.00	2.4932	.6330	74
	1.00	2.8418	.7005	79
	Total	2.6732	.6890	153
Coherence	.00	2.3226	.6799	74
	1.00	2.7199	.6276	79
	Total	2.5278	.6811	153

Assesment	.00	1.5631	.6191	74
	1.00	2.1540	.7529	79
	Total	1.8682	.7502	153

As can be seen in Table 1, the mean scores for the two groups of students who designed the lesson and unit plans were mostly between the basic (2) and proficient (3) levels, but consistently higher for the group using the backward design method. When I analyzed scores carefully though, some showed low levels of performance in both the backward design and traditional groups. For example, for the components demonstrating knowledge of students and assessing student learning, the backward design students scored 2.4 and 2.15 respectively and the traditional students scored 2.0 and 1.56 respectively. Even though the backward design students outscored the traditional students, their basic level of performance is still undesirable. The research results indicate that work needs to be done in the areas of demonstrating knowledge of students and assessing student learning when teaching curriculum design according to either model.

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